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PCT/EP2003/008043

Translation

PATENT COOPERATION TREATY

PCT

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference B02/0106PC	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP2003/008043	International filing date (*day/month/year*) 23 July 2003 (23.07.2003)	Priority date (*day/month/year*) 23 July 2002 (23.07.2002)
International Patent Classification (IPC) or national classification and IPC B01D 3/32		
Applicant BASF AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 20 February 2004 (20.02.2004)	Date of completion of this report 14 July 2004 (14.07.2004)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

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International application No.
PCT/EP2003/008043

I. Basis of the report

1. This report has been drawn on the basis of (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

☐ the international application as originally filed.

☒ the description, pages 1-22, as originally filed,
pages _____, filed with the demand,
pages _____, filed with the letter of _____,
pages _____, filed with the letter of _____.

☒ the claims, Nos. 1-10, as originally filed,
Nos. _____, as amended under Article 19,
Nos. _____, filed with the demand,
Nos. _____, filed with the letter of _____,
Nos. _____, filed with the letter of _____.

☒ the drawings, sheets/fig 1/4-4/4, as originally filed,
sheets/fig _____, filed with the demand,
sheets/fig _____, filed with the letter of _____,
sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-10	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-10	NO
Industrial applicability (IA)	Claims	1-10	YES
	Claims		NO

2. Citations and explanations

1. The invention essentially concerns a method of purifying oxiranes which is carried out using a partition column (claims 1 to 9). Claim 10 concerns a device which comprises further installations in addition to the above-mentioned partition column, namely a separation apparatus, an isothermic reactor and an adiabatic reactor.

With the exception of the partition column, the features of the claimed purification method are known from WO-A-00 07965 (D1), referred to on page 1 of the description. Built as described with respect to the claimed method, partition columns are *per se* known from documents EP-A-0122367 (D2), EP-1151781 (D3), and WO-A-02 40434 (D4) for fractionating product mixtures with close boiling points, However, none of these documents mentions the fractionation of oxirane/alkene mixtures. The recycling of non-converted feed-stock in the effluent in the partition columns in D2 to D4, and the preceding or subsequent use of isothermic and adiabatic reactors is not described either.

Owing to these distinguishing features, the claimed subject matter appears to meet the novelty requirement of PCT Article 33(2).

2. Inventive step

2.1 Production method according to claims 1 to 9

Proceeding from D1, which is considered the closest prior art, the method of purification using a partition column is considered the essential distinguishing feature. The technical function of this partition column is already described in detail in the prior art. D2 (see page 1, lines 25 to 29; page 2, lines 17 to 26), D3 (page 2, lines 1 to 40) and D4 (page 1, lines 25 to 28; figure 1) disclose the evident advantages of these design features, namely a higher degree of separation, i.e. greater product purity, with lower energy consumption and a favourable thermal load on the mixing system. D2 (page 4, lines 22 to 26) states that "this type of column can be designed in terms of thermal capacity, number of separating stages, arrangement of feed points and side discharge points and length of the separating device effective in the longitudinal direction (division) with the aid of a computer or experimentally in the manner of column which is not longitudinally divided". Moreover, D2 and D3 show that the application examples are not limiting, but are suitable in general for separating close-boiling mixtures (see, for example, D3: pages 2, lines 5 to 7, "multicomponent mixtures", "liquid and gaseous media"). On page 3 of the description, the applicant states that the object is to optimize the purification of oxiranes by distillation, in particular in terms of energy consumption, thermal

load and product purity. A person skilled in the art seeking a suitable solution would have consulted D2 and D3 since they address this problem of separation. Since the process parameters can be determined by computer or experiment (see D2), it is routine procedure for a processing engineer to adapt the partition column as per the invention to the separation problem in hand. Proceeding from D1, a person skilled in the art would have used the teaching of D2 (and/or of D3) to solve the problem of interest, without thereby being inventive. Therefore claims 1 to 9 do not appear to meet the requirements of PCT Article 33(3).

2.2 Device according to claim 10

The claimed device is a juxtaposition of devices (reactors and partition column) which are not functionally connected. Since a person skilled in the art is familiar with the method of use and advantages of each individual device *per se* (D2 to D4) and the method of separation in epoxy production using reactors of the above-mentioned type is likewise prior art (D1), it is not clear on what an inventive step could be based for the claimed device. In this connection it should be noted that the device is not based on a particular purpose but is to be considered merely a device suitable for carrying out the claimed method. Therefore this claim does not appear to meet the requirements of PCT Article 33(3).